CLAIMS

1. An equipment fan, having an external housing (12)

whose inner side is penetrated by an air conveying conduit (16) in which is arranged a fan wheel (22; 122) that is rotatable about a central axis (25) and comprises a central hub (20; 120) having an outer periphery (27; 127) on which are mounted fan blades (26; 126) whose radially outer rims (40; 140) are each at a distance (d) from the adjacent inner side (17) of the fan housing (12),

which blades (26; 126) each have a profile that is implemented similarly to the airfoil profile of an aircraft,

the blades each being implemented in concave and sickle-shaped fashion on their front edge (128), in such a way that the radially outer end (130) of a sickle (128) is located, with reference to the rotation direction (124), farther forward in the circumferential direction than the hub-side end (132) of the sickle (128),

and the blades are furthermore implemented in twisted fashion and have a convex rear edge (136),

and along the twisted radial outer edge (40; 140) of each fan blade (26; 126) and adjacently to the inner side (17) of the external housing (12), a flow element (42; 142) is provided which has an outline analogous to that of the associated fan blade (26; 126) and which is implemented as a flow-pattern obstacle for a compensating flow proceeding around that twisted radial outer edge (40; 140) from the delivery side to the intake side, in order to reduce the noise generated during operation by the equipment fan (10).

2. The fan according to claim 1, which comprises an external housing (12) away from which extends at least one strut (18) proceeding transversely to the air conveying conduit (16),

and the rear edge (36; 136) of the blades (26; 126) is implemented convexly, in such a way that upon rotation of the fan wheel (22; 122) rear edge (36; 136), viewed in plan, intersects that strut (18) at different locations at successive points in time.

3. The fan according to claim 2,

wherein the convex rear edge (36; 136) is implemented with grazing intersections.

4. The fan according to any of the preceding claims,

wherein the concavely sickle-shaped front edge (128) has a region (132) that lags the most with reference to the rotational motion (124), which region is located substantially at the transition from the hub (120) to the front edge (128) of the relevant blade (126).

5. The fan according to any of the preceding claims,

wherein the concavely sickle-shaped front edge (128) encloses, with the region of the hub (120) located in front of the relevant blade (126), an angle (alpha) that is equal to approximately 90° or less.

6. The fan according to any of the preceding claims,

wherein the blade (126) is twisted in such a way that its thread pitch is greater at the hub (120) than in the region of the radially outer edges (140).

7. The fan according to any of the preceding claims,

wherein the fan blades (126) have, viewed in a sagittal section, a profile that corresponds approximately to an airfoil profile.

8. The fan according to any of the preceding claims,

wherein the flow elements (142) extend at least locally on both sides, i.e. on the delivery side and intake side, along the radially outer rim (140) of the fan blades (126).

9. The fan according to any of the preceding claims,

wherein the flow elements (142) each have a profile that, in the region of the front edge (128) of a fan blade (126), increases from that front edge (128) in the manner of the front edge of an airfoil,

and tapers in the region of the rear edge (136) in the manner of the rear edge of an airfoil.

10. The fan according to any of the preceding claims,

wherein the fan blades (26; 126), viewed in a radial section, are implemented convexly toward the intake side,

and transition at least over a part of their extension, in their radially outer region, with a radius of curvature, into a portion of the associated flow element (42; 142) projecting toward the intake side.

11. The fan according to any of the preceding claims,

wherein the fan blades (26; 126), viewed in a radial section, are implemented concavely toward the delivery side, and transition at least over a part of their extension, with their radially outer rim, with a radius of curvature, into a portion of the associated flow element (42; 142) projecting toward the delivery side.

12. A fan having an air conveying conduit (16) and a fan wheel (22; 122) arranged therein, which wheel is rotatable about a central axis (25) and comprises a central hub (20; 120) having an outer periphery (27; 127) on which are mounted fan blades (26; 126) that extend with their radially outer rims (40; 140) as far as a surface (17) that is substantially coaxial with the central axis (25) and delimits the air conveying conduit (16) externally,

which blades (26; 126) each have a profile that is implemented similarly to the airfoil profile of an aircraft,

there being provided, along the radial outer edge (40; 140) of the fan blades (26; 126), a respective flow element (42; 142) that is implemented as a flow-pattern obstacle for a compensating flow proceeding around that radial outer edge (40; 140) from the delivery side to the intake side,

which flow element (42; 142) is likewise implemented in cross section substantially like an airfoil profile, and has in the region of the front edge (28; 128) and the rear edge (36; 136) of a blade (26; 126) substantially the same outline as the adjacent part of the associated blade (26; 126),

and in a middle region (48) between the front and back edge is wider, by an approximately constant amount, than the adjacent part of the blade (26; 126).

13. The fan according to claim 12,

wherein in a transition region between the front edge (28; 128) and middle region (48), the ratio of the axial extension of the flow element (42; 142) to the axial extension (D) of the adjacent blade (26) increases in the direction away from the front edge (28; 128).

14. The fan according to claim 12 or 13,

wherein in a transition region between the rear edge (36; 136) and middle region (48), the ratio of the axial extension of the flow element (42; 142) to the axial extension (D) of the adjacent blade (26; 126) increases in the direction away from the rear edge (36; 136).

15. The fan according to any of claims 12 to 14,

wherein the flow elements (42; 142) extend at least locally on both sides, i.e. on the delivery and intake sides, along the radially outer rim of the fan blades (26; 126).

16. The fan according to any of claims 12 to 15,

wherein the flow elements (42; 142) are implemented to be at least locally higher on the delivery side, viewed in the axial direction, than on the intake side.

17. The fan according to any of claims 12 to 16,

wherein the blades (26; 126) are each twisted in such a way that their pitch at the hub (20; 120) is greater than the pitch in the region of the radially outer edge (40; 140).

18. The fan according to any of claims 12 to 17,

wherein the blades (26; 126) are implemented in the region of the rear edge convexly and with grazing intersections.

19. The fan according to any of claims 12 to 18, which comprises an external housing (12) from which there extends away at least one strut (18) proceeding transversely to the air conveying conduit (16),

and the rear edge (36; 136) of the blades (26; 126) is implemented convexly in such a way that upon rotation of the fan wheel (22; 122), that rear edge (36; 136), viewed in plan, intersects that strut (18) at different locations at successive points in time.

20. The fan according to any of claims 12 to 19,

wherein the fan blades (26; 126), viewed in a radial section, are implemented convexly toward the intake side, and transition at least over a portion of their extension, in their radially outer region, with a

radius of curvature, into a portion of the associated flow element (42; 142) projecting toward the intake side.

21. The fan according to any of claims 12 to 20,

wherein the fan blades (26; 126), viewed in a radial section, are implemented concavely toward the delivery side, and transition at least over a portion of their extension, with their radially outer rim, with a radius of curvature, into a portion of the associated flow element (42; 142) projecting toward the delivery side.

22. The fan according to any of the preceding claims, which is implemented as a diagonal fan,

and wherein the flow elements (42; 142) are provided only on the intake side of the blades (26; 126).